

Abstract of the Disclosure

A metallic base material is covered with a coating layer of intermetallic compound, or a plurality of metallic base materials are welded to each other with an intermetallic compound, with reduced energy consumption within a short period of time. First, metallic substance 31 in powdery form is piled up on metallic base material 2. Second metallic substance 3 in molten form is delivered onto piling layer 80 of the first substance. Thus, under the control of reaction initiation temperature, coating layer (or building up coating layer) 84 of intermetallic compound having a thickness of hundreds of microns (μm) to millimeters (mm) is formed on the base material 2 by the self-exothermic reaction between the first substance and the second substance. This method is also useful in the welding of a plurality of metallic base materials to each other with an intermetallic compound. The first substance can be constituted of, for example, Ni, Co or Fe. The second substance can be constituted of, for example, Al or Ti. Each base material may be constituted of a metal common with or homologous to the first substance or second substance. The first substance and the second substance can be used in powdery form or molten form, provided that at least one

thereof is used in molten form. The first substance may contain a ceramic for imparting reinforcement.

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